

AMENDMENTS TO THE CLAIMS

Claim 1 (currently amended). A massage method comprising the steps of:
providing a seat incorporating including more than one expandable chamber and including a pressure system and an exhaust system connected to each expandable chamber;
providing a controller configured to operate the pressure and exhaust systems according to multiple selectable predetermined massage control index sequences;
selecting a massage sequence by selecting one of the massage control index sequences, causing the controller to alternately:
produce an inflow of a fluid to each of the expandable chambers by providing fluid communication between selected ones of the expandable chambers and the pressure system; and
produce an outflow of fluid from each of the previously inflated expandable chambers by causing the exhaust system to actively draw fluid from those chambers.

Claim 2 (previously presented). The method of claim 1 in which the step of providing a seat includes:
providing a pressure system that includes a source of pressurized fluid and a supply valve connected to the controller for controlling fluid flow from the source of pressurized fluid to each of the expandable chambers;
providing each exhaust system with an exhaust valve connected to the controller for controlling the fluid flow from a previously inflated expandable chamber; and
operating the supply and exhaust valves to produce individual chamber to chamber inflation followed by chamber to chamber deflation.

Claim 3 (previously presented). The method of claim 2 in which:
the step of providing a seat includes providing an exhaust system that includes a common exhaust; and
an additional step of operating the exhaust system includes:
providing fluid communication between the expandable chambers and the common exhaust; and
opening the common exhaust in accordance with the massage index sequence.

Claim 4 (previously presented). The method of claim 2 in which:
the step of providing a seat includes:
providing a pressure system that includes a pressure pump; and
providing an exhaust system that includes an exhaust pump;
and including the additional step of selectively and alternately providing fluid communication between each expandable chamber and the pressure pump and the exhaust pump in accordance with the massage index sequence.

Claim 5 (previously presented). The method of claim 1 including the additional steps of:

providing a user initiated switch;

providing a range of desired massage index sequences in accordance with user selected preferences; and

operating the switch to select one of the desired massage index sequences from said range to produce individual chamber to chamber inflation followed by chamber to chamber deflation.

Claim 6 (previously presented). The method of claim 1 in which the step of providing a seat includes providing expandable chambers in a back and seat support.

Claim 7 (previously presented). The method of claim 1 including the additional step of operating the pressure system for each expandable chamber to equalize the pressure between predetermined ones of the expandable chambers as each of the predetermined ones of the expandable chambers are selectively inflated and deflated.

Claim 8 (previously presented). The method of claim 1 including the additional steps of:

providing a pressure sensor;

providing multiple valves and a pump;

providing a microcontroller programmed in response to a signal from said pressure sensor to operate the multiple valves and a pump to initially inflate the expandable chambers to a gross pressure level with all of the valves initially opening; the initial opening occurring prior to cyclically connecting each of the expandable chambers to the pressure source in accordance with the selected massage index sequence.

Claim 9 (previously presented). The method of claim 1 in which:

the step of providing a seat includes providing the expandable chambers as a series of zones; and

the step of selecting a massage sequence includes selecting a massage index sequence that first inflates each of the zones in a series fashion then deflates each of the zones in a reverse series fashion.

Claim 10 (previously presented). The method of claim 1 in which:

the step of providing a seat includes providing the expandable chambers as a series of zones including a first zone, a second zone and a third zone;

the step of selecting a massage sequence includes selecting a massage index sequence that:

equalizes the pressure in the first and second zones by fluid transfer therebetween;

thereafter inflates only the first zone and deflates the second zone while the first zone remains inflated;

thereafter equalizes the pressure in the first and second zones;
thereafter inflates the second zone;

thereafter deflates the first zone while the second zone remains inflated; equalizing the pressure in the second and third zones by fluid transfer therebetween; and

thereafter inflating only the third zone and deflating the second zone while the third zone remains inflated.

Claim 11 (previously presented). The method of claim 1 in which:
the step of providing a seat includes providing first and second air cells (O, 1);
and

the step of selecting a massage sequence includes providing and selecting a massage index sequence that cyclically varies the pressure in the air cells by:
inflating the first air cell;
equalizing pressure between the first and second air cells;
deflating the first air cell;
reinflating the first air cell;
controlling the valved communication to equalize pressure between the first and second air cells following reinflation of the first air cell; and
deflating the first air cell.

Claim 12 (previously presented). The method of claim 2 in which:
the step of providing a seat includes providing first and second air cells (O, 1);
and

the step of selecting a massage sequence includes providing and selecting a massage index sequence that cyclically varies the pressure in the air cells by:
inflating the first air cell;
equalizing pressure between the first and second air cells;
deflating the first air cell;
reinflating the first air cell; controlling the valved communication to equalize pressure between the first and second air cells following reinflation of the first air cell; and
deflating the first air cell.

Claim 13 (previously presented). The method of claim 1 in which the step of providing a seat includes providing [the more than one] expandable chambers as a series of zones including zone 0; zone 1; zone 2; zone 3; zone 4; zone 5; zone 6; zone 7; and

the step of selecting a massage sequence includes providing and selecting a massage index sequence that includes equalizing the pressure in zones 0 and 1 by reducing the pressure in zone 1 and increasing the pressure in zone 0; inflate zone 0; deflate zone 1; equalize the pressure in zones 1 and 0 by fluid transfers from zone 0 to zone 1 reducing the pressure in zone 0 and increasing the pressure in zone 1; inflate zone 1; deflate zone 0; equilibrate zones 2 and 1 (air transfers from zone 1 to zone 2 reducing the pressure in zone 1 and increasing the pressure in zone 2); inflate zone 2; deflate zone 1; equilibrate zones 5 and 2 (air transfers from zone 2 to zone 5 reducing the pressure in zone 2 and increasing the pressure in zone 5); inflate zone 5; deflate zone 2; equilibrate zones 6 and 5 (air transfers from zone 5 to zone 6 reducing the pressure in zone 5 and

increasing the pressure in zone 6); inflate zone 6; deflate zone 5; equilibrate zones 7 and 6 (air transfers from zone 6 to zone 7 reducing the pressure in zone 6 and increasing the pressure in zone 7); inflate zone 7; deflate zone 6; equilibrate zones 6 and 7 (air transfers from zone 7 to zone 6 reducing the pressure in zone 7 and increasing the pressure in zone 6); inflate zone 6; deflate zone 7; equilibrate zones 5 and 6 (air transfers from zone 6 to zone 5 reducing the pressure in zone 6 and increasing the pressure in zone 5); inflate zone 5; deflate zone 6; equilibrate zones 2 and 5 (air transfers from zone 5 to zone 2 reducing the pressure in zone 5 and increasing the pressure in zone 2); inflate zone 2; deflate zone 5; equilibrate zones 1 and 2 (air transfers from zone 2 to zone 1 reducing the pressure in zone 2 and increasing the pressure in zone 1); inflate zone 1; deflate zone 2; repeat.

Claim 14 (previously presented). The method of claim 2 in which the step of providing a seat includes providing expandable chambers including a series of zones including zone 0; zone 1; zone 2; zone 3; zone 4; zone 5; zone 6; zone 7; and

the step of selecting a massage sequence includes providing and selecting a massage index sequence including equalizing the pressure in zones 0 and 1 by reducing the pressure in zone 1 and increasing the pressure in zone 0; inflate zone 0; deflate zone 1; equalize the pressure in zones 1 and 0 by fluid transfers from zone 0 to zone 1 reducing the pressure in zone 0 and increasing the pressure in zone 1; inflate zone 1; deflate zone 0; equilibrate zones 2 and 1 (air transfers from zone 1 to zone 2 reducing the pressure in zone 1 and increasing the pressure in zone 2); inflate zone 2; deflate zone 1; equilibrate zones 5 and 2 (air transfers from zone 2 to zone 5 reducing the pressure in zone 2 and increasing the pressure in zone 5); inflate zone 5; deflate zone 2; equilibrate zones 6 and 5 (air transfers from zone 5 to zone 6 reducing the pressure in zone 5 and increasing the pressure in zone 6); inflate zone 6; deflate zone 5; equilibrate zones 7 and 6 (air transfers from zone 6 to zone 7 reducing the pressure in zone 6 and increasing the pressure in zone 7); inflate zone 7; deflate zone 6; equilibrate zones 6 and 7 (air transfers from zone 7 to zone 6 reducing the pressure in zone 7 and increasing the pressure in zone 6); inflate zone 6; deflate zone 7; equilibrate zones 5 and 6 (air transfers from zone 6 to zone 5 reducing the pressure in zone 6 and increasing the pressure in zone 5); inflate zone 5; deflate zone 6; equilibrate zones 2 and 5 (air transfers from zone 5 to zone 2 reducing the pressure in zone 5 and increasing the pressure in zone 2); inflate zone 2; deflate zone 5; equilibrate zones 1 and 2 (air transfers from zone 2 to zone 1 reducing the pressure in zone 2 and increasing the pressure in zone 1); inflate zone 1; deflate zone 2; repeat.

Claim 15 (previously presented). The method of claim 1 in which the step of selecting massage intensity includes selecting a massage index sequence that achieves a selected variable target pressure within each selected chamber by scaling inflation time.

Claim 16 (previously presented). The method of claim 1 in which:

the step of providing a seat includes providing a pressure sensor in fluid communication with each chamber and connected to the controller; and

the step of selecting massage intensity includes selecting a massage index sequence that achieves a selected variable target pressure within each selected chamber by increasing fluid pressure in each chamber only until the controller receives respective

signals from the pressure sensors indicating that their respective target pressures have been reached.

Claim 17 (previously presented). The method of claim 1 in which the steps of selecting massage sequence and massage intensity are accomplished simultaneously by selecting a single massage control index sequence.

Claim 18 (canceled).

Claim 19 (previously presented). The method of claim 1 in which:
the step of providing a seat includes providing an exhaust system that includes an exhaust pump; and
an additional step of operating the exhaust system includes:
providing fluid communication between selected chambers to be deflated and the exhaust pump; and
operating the pump to evacuate the selected chambers.

Claim 20 (currently amended). A seat comprising:
more than one expandable chamber incorporated into the seat;
a pressure system connected to each expandable chamber and configured to provide fluid into the expandable chambers; and
an exhaust system connected to each expandable chamber and configured to produce an outflow of fluid from the expandable chambers by actively drawing fluid from them.

Claim 21 (previously presented). A seat as set forth in claim 20 in which:
the pressure system includes a source of pressurized fluid connected by fluid supply paths to respective supply valves positioned to selectively provide fluid communication between each expandable chamber and the source of pressurized fluid;
the exhaust system includes exhaust valves connected to each respective chamber and configured to control the fluid flow from the respective chambers;
a controller is operatively connected to the supply and exhaust valves and is configured to inflate selected chambers by opening corresponding ones of the supply valves and to deflate selected chambers by opening corresponding ones of the exhaust valves; and
the exhaust valves are distinct from the supply valves and the fluid supply paths to minimize dwell time between inflation and deflation.

Claim 22 (previously presented). A seat as set forth in claim 20 in which a controller is connected to the pressure and exhaust systems and configured to:

control massage sequence by alternately operating the pressure and exhaust systems for selected chambers according to a predetermined massage control index sequence; and

control massage intensity by allowing fluid pressure within the selected chambers to increase only until a selected variable target pressure is reached.

Claim 23 (previously presented). A seat as set forth in claim 20 in which the exhaust system includes an exhaust pump connected to the controller and operable to draw fluid from selected chambers.

Claim 24 (previously presented). A seat as set forth in claim 22 in which:
the controller is further configured to provide a range of different massage index sequences; and
the apparatus includes a user actuatable switch connected to the controller and configured to select between the different massage index sequences.

Claim 25 (previously presented). A seat comprising:
more than one expandable chamber;
a pressure system connected to each expandable chamber and configured to provide fluid into the expandable chambers;
an exhaust system including separate exhaust valves connected to each respective expandable chamber and configured to produce an outflow of fluid from the expandable chambers through the exhaust valves; and
a controller connected to the pressure and exhaust systems and configured to control massage sequence by alternately operating the pressure and exhaust systems for selected chambers and operating selected ones of the exhaust valves according to a predetermined massage control index sequence.

Claim 26 (previously presented). The method of claim 1 including the additional step of selecting massage intensity by allowing fluid pressure within the selected chambers to increase only until a selected variable target pressure is reached.